

C L A I M S

1 1. A method of adjusting a treatment machine in which a
2 transporting chain for transporting objects to be treated is guided in loops
3 through at least one treatment station in a machine housing and driven at
4 least at two locations by drives which in a normal operation are synchronized
5 and adjusted relative to one another so that the transporting chain in its
6 guides is neither tightly pulled nor compressed, the method comprising the
7 steps of:

8 a. Selecting two drives which follow one another in a forward
9 direction of the transporting chain;
10 b. asynchronously driving the selected drives, so that a chain
11 portion located therebetween is tightly pulled or compressed by
12 producing a length difference, and measuring a parameter
13 which is dependent from a drive moment of one or both
14 selected drives;
15 c. when the parameter reaches or exceeds a fixed value,
16 - operating the drives asynchronously for reducing the
17 previously produced length difference by a predetermined
18 amount;

1 d. Subsequently maintaining the adjusted relative position of the
2 both drives relative to one another, with asynchronous
3 operation of the drives; and
4 e. using the preceding steps for further drives, until chain lengths
5 in all chain portions to be adjusted are adjusted.

1 2. A method as defined in claim 1; and further comprising the
2 step of operating synchronously a drive arranged in a drive direction between
3 a chain portion to be adjusted and a compensating portion of the transporting
4 chain for receiving an excessive chain length, together with a selected drive
5 and/or all remaining drives together with the other selected drive.

1 3. A method as defined in claim 1; and further comprising
2 providing a parameter which is independent from the drive moment, for each
3 chain portions to be adjusted.

1 4. A method as defined in claim 1; and further comprising
2 providing a special predetermined amount for a reduction of the previously
3 produced length difference for each chain portion to be adjusted.

1 5. A method as defined in claim 1; and further comprising, first
2 pulling tight the chain portion adjusted in the steps b and c until reaching a
3 first parameter, and then with registering the chain lengths which is required
4 for it, compressing the chain portion until reaching a second parameter value
5 or vice versa; and providing an amount of subsequent adjusting steps in
6 dependence on the registered chain length.

1 6. A method as defined in claim 1; and further comprising
2 electrically controlling the drives; and performing the method automatically
3 by a programmable microprocessor.

1 7. A method as defined in claim 6; and further comprising
2 providing the drives with rotary sensors for determination of their relative

1 angular positions; storing the angular positions; and performing the
2 synchronization of an electrical path by controlling the drives.

1 8. A method as defined in claim 1; and further comprising
2 providing the drives with electric motors; and measuring current consumption
3 of the electric motors as parameters which are dependent from drive
4 moments.

1 9. A method as defined in claim 1; and further comprising
2 forming the drives as electrical drives; fixing a first electrical drive arranged
3 in the forward direction of said transporting chain after a compensation
4 portion and before a chain portion to be adjusted; operating a subsequently
5 arranged second electrical drive synchronously with all subsequent electrical
6 drives in the forward direction until its current consumption exceeds a
7 predetermined value; then stopping the second drive together with all
8 subsequent drives, turning them back by predetermined rotary angle
9 opposite to the forward direction, and subsequently stopping; continuing the
10 method with a third and subsequent drives correspondingly until a last chain
11 portion arranged before the compensation portion is adjusted.

1 10. A method as defined in claim 1; and further comprising
2 forming the drives as electrical drives; fixing a first electrical drive arranged
3 in the forward direction of said transporting chain after a compensation
4 portion and before a chain portion to be adjusted; operating a subsequently
5 arranged second electrical drive in the forward direction until its current
6 consumption exceeds a predetermined value, stopping the second drive
7 together with subsequent drives and turning the first drive by a
8 predetermined rotary angle in the forward direction, and subsequently fixing
9 it together with said second drive; continuing the method with a third and all
10 subsequent drives until a last chain portion arranged before the
11 compensation portion is adjusted; and operating the chain portions adjusted
12 previously and the drives arranged after synchronously or fixing them
13 together.

1 11. A method as defined in claim 1; and further comprising
2 measuring chain length differences occurring during each adjustment; storing
3 the measured chain length differences; and evaluating their sum as an
4 indicator for a total chain length and/or chain wear.

1 12. A method as defined in claim 11; and further comprising
2 measuring a length of a chain sagging in a compensation portion and
3 evaluating it as an indicator for a total chain length and/or chain wear.

1 13. A method as defined in claim 1; and further comprising
2 using a programmable control for performing the adjustment.